Oroville Facilities FERC Relicensing

SP –T4

Vegetation & WHR Mapping

December 2003

Reasons for Study

- Vegetation cover maps will be included in FERC application
- Used to plan other studies related to botanical and wildlife resources
- Used by other Work Group studies including Fisheries, Land-Use, and Recreation

Study Area

- project area
- one-mile buffer
- downstream Feather River to confluence with the Sacramento River (within the FEMA 100-year floodplain

Tasks in SP – T4

- Vegetation Mapping
- Wildlife Habitat Maps (CWHR)
- Cultural plant maps
- Plant species lists
- Wildlife habitat analysis (Dave)

- Eight broad vegetation/land-use categories defined
- Further divided into 79 different associations
- Vegetation associations defined by single species (i.e. Fremont cottonwood riparian forest) or two species (i.e. Fremont cottonwood/black willow riparian forest) whenever possible
- Mixed categories used when 3 or more species co-dominant or couldn't discern from aerial photographs and no field data available
- Classification system based on Sawyer/Keeler Wolf and the Holland systems

- GIS coverage of fire perimeters obtained from CDF was used to redefine each polygon that occurred within a fire perimeter. Changes were made based on intensity, location, etc. and field surveys

Acreages of general vegetation/land-use categories

Vegetation/Land-Use Category	Acreage		
	Project Area	One-Mile Buffer	Feather River Floodplain
Aquatic/Submerged	443.4	33.3	89.9
Disturbed/Agriculture	126.3	10063.3	16173.9
Disturbed/Other	2327.7	11332.9	3084.0
Open Water	19796.4	766.7	3150.6
Riparian Forest/Woodland	3237.8	1042.8	4268.5
Riparian Shrub/Scrub	214.6	285.9	2175.5
Upland Forest/Woodland	11100.5	62145.0	64.3
Upland Herbaceous	2751.5	12217.9	2661.4
Upland Shrub/Scrub	231.9	2288.6	
Wetland	911.7	347.5	210.1
Unknown		13.3	
Total Acres	41,141.8	100,537.2	31,878.1

Wildlife Habitat Relationships (WHR)

- Classification system used by WHR System used to predict wildlife habitat relationships
- Provides crosswalk to WHR categories from those used by other systems, such as Sawyer/Keeler-Wolf and Holland
- Habitat stages further defined by percent canopy closure, average diameter, crown decadence, height class, and for aquatic types by lacustrine or riverine and substrate and how long the area is submerged

Culturally Important Plant Species

- Plant list obtained from Cultural Resources Work Group
- 17 species or groups of plant identified
- Information requested included presence/absence, habitat and distribution data
- Presence/absence and habitat information included in report. Specific distribution data included in separate report to Cultural Resources Work Group

Plant Species in Project Area

- **677 plant species identified in project area**
- **72% native species, 28% non-native species**
- **Higher percentage of non-native plant species below the Lake Oroville Dam than above**

	Number of spp.	Lake Oroville Area	Below Lake Oroville	Both	Total Lake Oroville	Total Below dam
Native	487 (72%)	187	160	140	327 (75.2%)	300 (64.4%)
Non-native	190 (28%)	24	82	84	108 (24.8%)	166 (35.6%)
Total taxa	677	211	242	224	435	466

- Project area located within both the eastern edge of Sacramento Valley and lower foothills of Sierra Nevada Mountain Range.
- Vegetation patterns a mosaic of different plant assemblages that grow together in one place
- These patterns vary depending on elevation, precipitation, temperature, soils, aspect, slope and disturbance history, such as fire.

Foothill Vegetation

- Vegetation around Lake Oroville and the Thermalito Diversion Pool composed of open woodland, forest, and chaparral communities
- At the lower end, slopes are more moderate, vegetation is mostly blue oak or mixed oaks, with foothill pine woodland, open grasslands, and some chaparral
- ~1,100 acres of blue oak-foothill pine woodland with a chaparral component occur in this area

Foothill Vegetation (cont.)

- ~1,400 acres of foothill pine-mixed oak woodland/chaparral occur in project area
- Common in lower elevation around the mainstem of Lake Oroville
- Blue oaks drop out fairly quickly as the dominant woodland type with distance upstream from the Dam

Foothill Vegetation (cont.)

- Vegetation of the West Branch heavily influenced by serpentine bands
- Southern end with blue oak woodlands in mosaic with live oaks and grassy openings
- Further up denser chaparral/mixed live oak
- Ponderosa pines and black oaks replace foothill pines as elevation and slopes increase
- Vegetation on serpentine soils more xeric and open, supporting sparse foothill pine/chaparral and unique vegetation

Foothill Vegetation (cont.)

- North Fork – north-facing slopes and narrow canyon sides gives rise to cooler, moister environment
- Dense Douglas fir/ponderosa pine/tanoak and other mixed hardwood/conifer types with black oaks, tanoaks, madrone, and tall canyon live oaks
- No grassland, blue oak, chaparral, and interior live oak component

Foothill Vegetation (cont.)

- Middle Fork – granitic rock and decomposed granite soils
- South-facing slopes with open oaks, foothill pine, grass, and chaparral
- North-facing slopes with ponderosa pine, live oaks, and black oaks
- Farther up the canyon, mostly dense mixed conifer-hardwoods on north-facing slope with various open ponderosa pine-live oak-shrub types on rocky south-facing slopes

Foothill Vegetation (cont.)

- South Fork – more jumbled geology, metavolcanic and granite
- North-facing slopes with blue oak, dense mixed oak stands, and dense ponderosa pine, mixed oak forest as you proceed up the canyon
- South-facing slope with dense to moderately open mixed oak woodland with some chaparral gives way to ponderosa pine/mixed oak woodland/chaparral
- Ponderosa pine/Douglas fir forests at far end

Valley Vegetation

- Annual grasslands and riparian/wetlands are the dominant vegetation types below the Dam
- ~2,200 acres of annual grassland – dominated by non-native annual grasses with a profusion of spring flowering native bulbs
- Vernal pools and swales are common throughout the grasslands around the Thermalito Complex
- These mapped under T3/5

Valley Vegetation (cont)

- Wetland vegetation occurs around the margins of the Afterbay and Forebay
- Typically, a ring of *Juncus effusus* in wetter area
- Above this bank, a ring of rush/verbena occurs where standing water is not as frequent and/or for less duration.
- This band tends to have a high percentage of purple loosestrife
- Very little riparian woodland – scattered Fremont cottonwood and occasional willows.
- Forebay has higher percentage of woody riparian species

Riparian Vegetation

- ~ 50 acres of foothill/montane mixed riparian forest above the Dam. Usually thin strips along drainages with cottonwoods, willows, occasional sycamores, and alders. Higher elevations have maples and dogwoods.
- Over 2,400 acres of Fremont cottonwood riparian, 490 acres of valley mixed riparian, 117 acres of cottonwood/black willow, and 99 acres of mixed willow riparian forest occur in project area below the dam.
- ~ 600 acres of gravel tailings with little to no vegetation

Aquatic Vegetation/Ponds in OWA

- Over 300 acres of ponds occur in Project Area, mostly within the Oroville Wildlife Area (OWA)
- Aquatic/submerged vegetation occurs in ponds and along the margins of the river and canals
- ~398 acres of water primrose was mapped in the project area, mostly in the “D” area of the OWA
- Water meal, a very small vascular plant, tends to form blankets across some of the ponds giving a lime green appearance to the water

Feather River Floodplain downsteam of Project Area

- ~32,000 acres of land were mapped within floodplain to the confluence with the Sacramento River
- ~3,150 acres were open water
- Riparian vegetation restricted by flood control levees, agriculture, and land clearing for urbanization.
- Results are narrow zone of vegetation, sometimes as little as one tree wide.
- Some areas do have much more developed riparian area.
- ~3,198 acres mixed riparian forest/ 634 acres of Fremont cottonwood
- Downstream of Yuba City, valley oak riparian (114 acres) more common and 179 acres of valley oak/cottonwood riparian.